1   We claim:

1   1. A method of measurement of topographic features on a surface of a substrate, comprising:

2   a) directing a focused beam of particles to fall at a first angle θ_1 on to a first portion of the

3   surface of the substrate, where θ_1 is defined with respect to an average normal to the

4   surface of the substrate;

5   b) detecting particles emitted from the first portion of the surface of the substrate at a second

6   angle θ_2, where θ_2 is defined with respect to the average normal to the surface of the

7   substrate, the particles detected with a particle detector;

8   c) interposing a particle opaque material between the first portion of the surface of the substrate

9   and the particle detector, the particle opaque material having an edge;

10   d) determining the relative position of the edge and the first portion of the surface of the

11   substrate from the results of the detection of particles.

1   2. The method of claim 1, where the particles of the focused beam of particles are charged

2   particles.

1   3. The method of claim 2, where the charged particles are electrons.

1   4. The method of claim 2, where the charged particles are ions.

1   5. The method of claim 1, where the particle opaque material is separate from the substrate.

1   6. The method of claim 5, further comprising:

2   e) directing the focused beam of particles on to a plurality of portions of the surface of the

3   substrate; then,

4   f) determining the topographic features of the plurality of portions of the surface from the results

5   of the detection of particles.

1   7. The method of claim 6, wherein the topographic features of the plurality of portions form a

2   trench in the substrate, and wherein the trench and the edge form an angle significantly

3   greater than $0°$.

1   8. The method of claim 7, wherein the topographic features of the plurality of portions form a

2   trench in the substrate, and wherein the trench and the edge form an angle approximately

3             $90°$.

1   9. The method of claim 8, wherein the trench in the substrate has sidewalls which are

2   approximately parallel to the average normal to the surface of the substrate.

1   10. The method of claim 1, further comprising:

2   e) repeating steps a-d with at least one of the angles θ_1 and θ_2 changed.

1   11. The method of claim 10, further comprising determining the parameters of the focused

2   particle beam wherein the focused particle beam is focused on the surface of the

3   substrate.

1   12. The method of claim 1, wherein the particle opaque material between the first portion of

2   the surface of the substrate and the particle detector is a portion of the substrate.

1   13. The method of claim 12, further comprising:

2   e) directing the focused beam of particles on to a plurality of portions of the surface of the
3   substrate; then,

4   f) determining the topographic features of the plurality of portions of the surface from the results
5   of the detection of particles.

1   14. The method of claim 13, further comprising:

2   e) repeating steps a-f with a change of the angle θ_1.

1   15. The method of claim 13, wherein

2   the plurality of portions of the surface of the substrate are portions of the surface of a trench in
3   the substrate, and the edge is an edge of the trench.